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Overview of PSA Applications Performed at MNGP

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- Background of MNGP
- PSA Model and Tools
- List of PSA Applications
- Users of PSA Tools and Products
- Specific Example - Site Security

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- GE BWR-3
- 1775 MW_t 613 MW_e
- Commercial Operation: June 30,1971
- Plant Located 45 miles NW of Minneapolis, Minnesota, USA

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PSA Model and Tools

- Large Fault Tree, Small Event Tree
- EPRI Risk and Reliability Workstation

  CAFTA, PRAQUANT, EOOS, etc.
- SETS
- MAAP
- Top Event Prevention (TEP)
- SAPHIRE

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PSA Applications

Risk-Informing of Existing Programs

- NRC Regulations such as In Service Inspection, Technical Specifications
- NRC Oversight Program such as the Significance Determination Process

Plant Configuration Management

- On-Line Maintenance
- Outage Risk Assessment

Maintenance Rule

- Scope
- Risk Significant SSC Determination
- Performance Criteria

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PSA Applications - 2

Training Program

- Engineering and Technical Staff - Results
- Operator - Classroom, Simulator, and Job Performance Measures

Risk Ranking of Equipment

- Systems
- MOVs, AOVs, etc.

Nuclear Property Insurance

Site Security

Quality Assurance

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PSA Applications - 3

External Organizations

- WANO, INPO, NRC

Design Engineering

Evaluation of Plant Events

Emergency Planning Scenarios

General Plant Support

- Power Uprate, NRC Issues, Justification for Continued Operation (JCO), general staff questions on probabilities, equipment reliability, project priority, etc.

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Site Security Example

Demonstrates creative uses of PSA

- PSA use limited only by imagination, knowledge of PSA techniques and Plant Staff acceptance of PSA results

Required separate simple model

Methodology

- Uses Cut Sets from new PSA model
- Uses Prevention Sets from simple TEP analysis of new PSA Model

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Security Project Summary

Step 1 - Target Identification

- Meeting with personnel from Operations, Engineering, Emergency Planning, Training, PSA, Security
- Results in a new, simple fault tree that includes equipment locations

Step 2 - Analyze Fault Tree

- CAFTA used to quantify Fault Tree
- Review and select Prevention Sets
- Review and select target sets (cut sets)

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Security Project Summary

Step 3 - Response Procedures

- Security defends selected Prevention Sets
- Target sets are used to test security strategies and train the security force

Results

- Effective Site Security Plan
- Reduction in security staff size